

REMARKS

Introduction

This Amendment is responsive to the December 10, 2007 Office Action. In the Office Action, claims 1-4 stand rejected. In response, claims 1, 3, and 4 have been amended with clarifying language in accordance with the originally-filed specification and drawings. Claim 2 has been cancelled. The specification has been amended to correct a typographical error. No new matter has been introduced by the foregoing amendments. Claims 1 and 3-6 are now pending in this application. Claims 5 and 6 have been withdrawn.

Priority Documents

Applicants submit herewith an English-language translation of the priority document, Japanese Application No. 2003-293197 filed August 13, 2003, in accordance with 37 CFR §1.55, along with a statement that the translation is accurate.

Objections to the Title, Specification, and Claims

The Office Action objects to the title of the application as not being clearly indicative of the invention to which the claims are directed. The Office Action suggests a new title that does not refer to the withdrawn process claims. The withdrawn process claims, however, can be rejoined if the elected claims are subsequently allowed. MPEP § 821.04(b). Thus, Applicants respectfully submit that the current title may be maintained until a final disposition of the claims.

The Office Action has objected to the specification for a typographical error on page 13, line 6. This error was previously corrected with the Election and Amendment filed on October 31, 2007 in the present application. Accordingly, Applicants respectfully submit that the previously-filed Amendment overcomes this objection.

Claims 3-4 have also been objected to for the wording "is a protrusion provided in," which the Office Action asserts should read "is protrudent." The term "is a protrusion provided in" as used in claims 3 and 4 further defines the flow resistance-increasing region and is consistent with amended claim 1, which provides that the plurality of flow resistance-increasing regions are at least one of protrudent and concave regions. Thus, Applicants respectfully submit that the current claim language is acceptable.

Reconsideration and withdrawal of these objections are respectfully requested.

Claim Rejections under 35 U.S.C. §112, second paragraph

Claims 3 and 4 stand rejected under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In particular, the Office Action asserts that “the external wall” and “the other area” in claims 3 and 4, respectively, lack antecedent basis. Further, the Office Action asserts that claim 3 requires clarification for the language stating “the reaction vessel is reduced in thickness from the external wall.”

Applicants have amended claims 3 and 4 to provide proper antecedent basis and to clarify the claimed invention. Applicants submit that claims 3 and 4 meet the requirements under 35 U.S.C. §112, second paragraph, and respectfully request the reconsideration and withdrawal of the rejection of claims 3-4.

Claim Rejections Under 35 U.S.C. §102(e)

Claims 1-4 stand rejected under 35 U.S.C. §102(e) as being unpatentable over United States Patent No. 6,861,144 to Wakamatsu et al. (hereinafter “the ‘144 patent”). It will be noted that the ‘144 patent corresponds to JP2002-029726 which is discussed on pages 2-3 of the instant application in the “Background of the Invention” section.

The present invention, as defined by amended claim 1, is directed to a tubular reaction vessel comprising a longitudinally-extending wall with a space there inside, where a silicon deposition feedstock gas inflow opening and a deposited silicon discharge opening are provided at an upper portion and a lower end portion respectively. A plurality of flow resistance-increasing regions are provided on a wall surface of the tubular reaction vessel that is contacted with a feedstock gas. The plurality of flow resistance-increasing regions are at least one of protrudent and concave regions.

The ‘144 patent discloses a tubular reaction vessel including a longitudinally-extending wall with a space there inside, where the sectional area of part of the vessel may be larger than other parts of the vessel, as shown in Fig. 4, for improving the conversion of chlorosilane into silicon by extending the residence time of reaction gas.

In contrast, the present invention, by providing the reaction vessel internal wall with a plurality of flow resistance-increasing regions, not only is the diffusion-blocking upward flow effectively diminished but the feedstock gas in the vicinity of the reaction vessel

central axis can also be effectively mixed with the upward flow. Thus, the present invention is different from the extension of the residence time of reaction gas found in the '144 patent.

By forming the flow resistance-increasing regions, the feedstock gas can be effectively contacted with the deposition surface, thereby, silicone fine powder and the like can be re-contacted with the deposition surface and be incorporated in the deposit. Moreover, because the feedstock gas supplied is uniformly heated to high temperatures, the silane oligomer can be re-decomposed, therefore, the by-products discharged from the reaction vessel can be dramatically reduced.

The vessel disclosed in Fig. 4 of the '144 patent has a tapered shape and fails to disclose a plurality of flow resistance-increasing regions where the plurality of flow resistance-increasing regions are at least one of protrudent and concave regions as defined in amended claim 1. The plurality of flow resistance-increasing regions of the present invention, for example the flow resistance-increasing regions shown in Figs. 1-11, are clearly different from the tapered shape of the vessel disclosed by the '144 patent. Therefore, the '144 patent fails to anticipate claim 1.

With respect to claim 3, the vessels disclosed in the '144 patent not only fail to disclose a protrusion provided in the tubular reaction vessel, as discussed above, but the '144 patent also fails to disclose where an external well of the vessel is reduced in thickness in the protrusion-provided area. Therefore, the '144 patent fails to anticipate claim 3.

Furthermore, claims 3 and 4 depend from and add further limitations to independent claim 1. Thus, claims 3 and 4 are deemed to be in condition for allowance for all of the reasons set forth hereinabove.

Double Patenting Rejections

Claim 1 has been provisionally rejected based on non-statutory obviousness-type double patenting over claim 1 of co-pending Application No. 10/518197. The Office Action asserts that the conflicting claims are not patentably distinct from each other such that claim 1 of the above-identified application is anticipated or rendered obvious by claim 1 of the '197 application.

The Office Action at page 6 asserts that the '197 application discloses all of the limitations of claim 1. In particular, the Office Action asserts that the '197 application discloses a flow resistance-increasing region created on a wall surface of the tubular reaction

Application No. 10/567,943
Paper Dated: April 10, 2008
In Reply to USPTO Correspondence of December 10, 2007
Attorney Docket No. 1217-060312

vessel that is contacted with the feedstock gas, but does not specify which feature of the '197 application teaches the flow resistance-increasing region. The '197 application fails to teach or suggest a plurality of flow resistance-increasing regions provided on a wall surface of the tubular reaction vessel that is contacted with a feedstock gas as defined in amended claim 1.

Therefore, the claims of the present invention and the '197 application are patentably distinct from each other such that claim 1 of the above-identified application is neither anticipated nor rendered obvious by claim 1 of the '197 application.

Conclusion

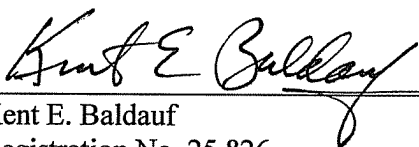
In view of the foregoing amendments and comments, Applicants respectfully request reconsideration of the rejections of claims 1, 3, and 4 and allowance of the same.

Should the Examiner have any questions regarding this information or wish to discuss this matter in further detail to advance prosecution, the Examiner is invited to contact Applicant's undersigned representative by telephone at the number provided below.

Respectfully submitted,

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